

Time . Sept. 7, 1942

The Real Bombing of Germany

Day by day, the task of arms and the price of victory grow greater. The early summer's burst of optimism seems childish now; with German troops in the Caucasus, and the *Afrika Korps* poised in Egypt, prophecies of victory have a bitter taste. And yet:

The U.S. and Britain possess a weapon that may open the road to victory. The weapon is combined Anglo-American air power.

TIME does not know whether Germany can be defeated from the air. No one knows, because air attack on the scale necessary to prove or disprove the assertion has never been tried. TIME does know, with all the world, that the Allies have no hope and no way of getting at the main German armies, in Russia or elsewhere, with the strength necessary to destroy them this year. Everyone also knows that the cost of destroying German arms by land assault—next year or the next year or the year after that—will be beyond any price that man has yet paid at all his Armageddons.

The question is not whether Germany can be defeated from the air. Air power is no substitute, no panacea for the pangs of war. The question is only whether the U.S. and Britain will elect to concentrate their maximum air strength against Germany this year. Bombing can mutilate Germany's might at home. Bombing, for the present, is the only way to strike the Germans at the sources of their power. Bombing, on a grand scale, is the only way to strike a blow which, if it does not de-

feat Germany, will at the least leave Germany crippled for the final blow to come.

The question can be decided only by the U.S. and British high commands. But they must decide it now. If they fail to make the right decision—or, worse, if they fail in the power to make decision—they will be held terribly accountable at the bar of history.

Only the high commands can weigh the demands of global war, the total strength in airmen and airplanes available to the U.S. and Britain, against the certainty that now is the best time to hit Germany from the air. The Allies have an opportunity they may never have again. German victory in Russia and in the Middle East may soon release Germany's main air fleets for defense of the homeland, or for assaults on the Allies' priceless air base in Britain.

TIME herewith summarizes, in terms that any one can understand, the elements of an all-out air offensive against Germany. Perhaps a concentration of Anglo-American air power, on the scale assumed in this summary, cannot be achieved this year; some authorities say it can be, others say it cannot. But, if it can be done, then the following pages give a clear statement of why it should be done, and of how it will work. Through no other course can American mass production strike so quickly so hard a blow at the actual heart of the enemy. An authority on today's air power and its use, Francis Vivian Drake, assisted TIME in assembling and checking the calculations which appear below. They are calculations as to what can be done with today's airplanes, the types now flying over Germany and Occupied Europe.

OBJECTIVE OF THE ATTACK

The primary objective of an air offensive is the destruction of that part of the enemy's war effort which is essential to the functioning of the mechanized forces and artillery with which he can resist a land invasion; and which, once destroyed, he is unable to replace from other theaters (e.g., the machine tools and production lines, communications and transportation systems). The secondary objective is the infliction of death, or the fear of death, upon those who operate the production and transportation systems.

It has been possible to establish a resistance factor for an industrial target of known size. When this factor is exceeded (Cologne) the target is finished or incapacitated for a long period. When it is not exceeded, the target will rebound and continue to function (Coventry, Birmingham, London). Air offensives therefore resolve into tons of bombs per target, and the requisite numbers and types of planes, the crews, fuel, bombs, spares and bases can be calculated with fair accuracy.

Chance can be eliminated to a degree impossible in land offensive.

Essential to the functioning of the German war machine are 31 key cities and their suburbs. These cities comprise the core of the German war production. They fall into three main groups:

WESTERN

Essen	Mannheim
Cologne	Stuttgart
Düsseldorf	Saarbrücken
Frankfurt	Friedrichshafen

CENTRAL

Bremen	Hamburg
Hanover	Magdeburg
Kassel	Dessau
Nuremberg	Halle
Augsburg	Leipzig
Munich	Chemnitz
Rosenheim	Pilsen

Linz

EASTERN

Kiel	Posen
Rostock	Lodz
Stettin	Liegnitz
Berlin	Breslau

The northwestern areas are within 300 to 400 miles of London, the central within 600 miles, and the southeastern areas within 900 miles.

Destruction of the industrial areas of one-third of these cities would constitute a staggering blow to the German war effort.

Destruction of two-thirds would produce almost complete disorganization throughout the Reich.

Destruction of all 31 targets would cripple war production to a degree that would render inevitable the defeat of the German armies.

Force Requisite

1) Bombers of sufficient range to reach all targets.

2) Total bomb loads sufficient to demolish all targets.

3) Replacement power sufficient to sustain continuous bombing for as many months as are necessary to secure cumulative effect.

Having stated the general objectives, it is now necessary to examine the actual facts of present air strength and replacement

power. In this consideration, production in mid-1943, or in 1944, and newly designed aircraft not now in production are ignored. This calculation takes into account *only* types now in use, and production rates actually achieved in existing plants.

Suitable Weapons

Out of the total U.S. air program, the air striking power is represented by the following four types, all of which have sufficient range to bomb throughout Germany from England.

B-17. Four-engined Boeing Flying Fortress, radius 1,000-1,200 miles, average bomb load three tons.

B-24. Four-engined Consolidated. Performance, substantially same as B-17.

B-25. Two-engined North American (Tokyo raid). Range 800-1,000 miles, average bomb load 2½ tons.

B-26. Two-engined Martin. Performance, about same as B-25.

Bombing Power

The above four types have a capacity of some three tons of bombs each at medium radii of between 500 and 1,000 miles. British heavy and medium bombers—the Stirling, Lancaster, Halifax, Wellington, etc.—have the same average radii and in some cases much larger bomb capacities.

Production Rate

The United States is now producing the above four types at the rate of many hun-

dreds a month. The schedule originally set by President Roosevelt was 500 four-engine bombers a month. After Pearl Harbor the President ordered this schedule doubled, and under it the United States is due to reach a production of 1,000 a month in 1943. British production of equivalent types is believed to be several hundred a month.

Available Material

United States. Concentration of a substantial part of our production—for four months, say—can provide a task force of more than 1,500 long-range bombers ready for action by the end of 1942. (This allocation would leave ample for maintenance of fronts already in being and for great operations such as the Solomons which must have continued air support.)

Great Britain. The British already possess at least 1,500 long-range types (e.g., Cologne, etc.).

Joint Task Force

The following joint task force could therefore be assembled:

Planes operational 1,000 bombers
Planes in active reserve 2,000 bombers

Total 3,000 bombers

Bombing power per flying night 3,000-5,000 tons

Bombing power per month (assuming ten operating nights) 30-50,000 tons

(The above assumes that either the 1,000 operational planes are used on any

one night, or up to 2,000 per night if sequence of weather limits operations to less than ten nights a month.)

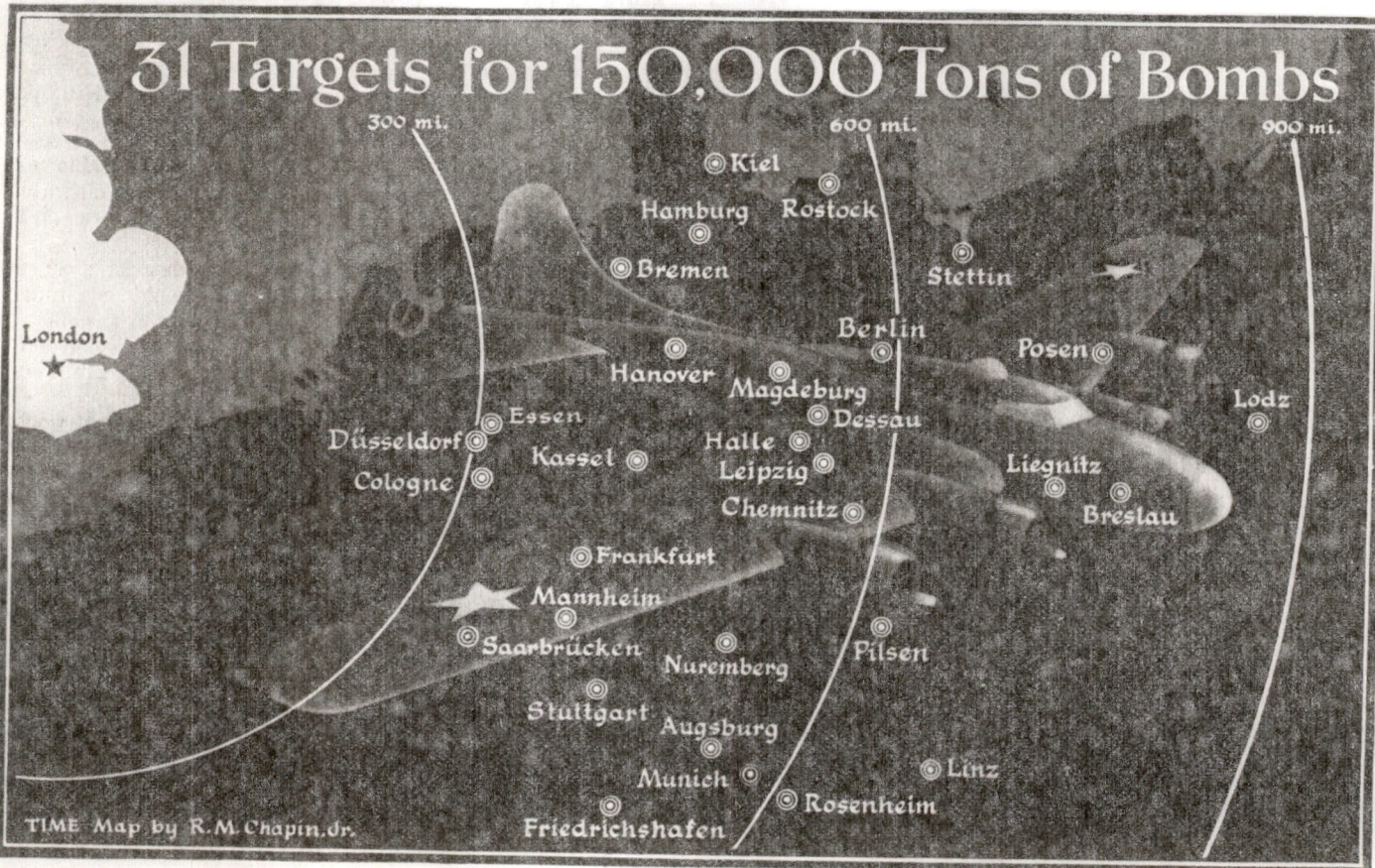
Continuity

Effect. The effect of continuous bombing has been found to be much greater than that of desultory raids, ton for ton. This is due to the effects of secondary fires, disorganization, wrecking of repair equipment, transport and communication systems.

The rate of continuous bombing is *controlled by the ability of the attackers to replace their losses.*

In general the proportion of losses in bombing raids is decreased as the number of planes used over a given target is increased. One reason is that a large fleet of bombers has greater protection against enemy fighters (because of its vast firepower) and is also impossible to attack except piecemeal because of its size and spread. Another reason: if ten bombers are over a target defended by 100 guns, the ratio is 10 guns per plane. If 100 bombers are over the target the ratio is one gun per plane. Damage to anti-aircraft equipment by bombs and blast interference with radio equipment is also a factor. R.A.F. losses through 1941 averaged 10% per raid, on a long series of small raids. The Cologne, Essen, Bremen mass raids, involving between 400 and 1,000 planes, reduced the loss factor to an average of 4% per raid.

Losses per month of 3,000-plane task force. To deliver 30-50,000 tons of bombs per calendar month requires that a maxi-



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num of about 15,000 bombers shall contact the targets. The present loss rate of 4% would therefore require maximum replacements of 600 planes per calendar month to maintain continuous bombing. Losses in pilots, crews, etc., at this rate, over a six months period might total about 25,000 men.

The joint U.S.-British output of planes and crews will exceed the above replacement rate by the end of 1942.

The facts so far summarize as follows: In a 120-day period following decision to open the offensive, the United States and Great Britain can assemble a Joint Task Force of over 3,000 long-range bombers, can replace them at the rate of 600 per month, can equip them with trained crews, can drop 30,000-50,000 tons of bombs per month on any and all German targets, can maintain this performance indefinitely.

Effect

The effect of this campaign obviously cannot be forecast with precise mathematical accuracy. However, it can be estimated very closely by comparison with the results achieved by the enemy upon British cities, where the tonnage of bombs dropped was reliably estimated, and with the results achieved by the recent R.A.F. mass raids. The effect of a continuous campaign can also be estimated as an extension of the raids on Bremen, Mainz, etc.

The following is a record of past performances involving use of air power:

TARGET	TONS DROPPED	EFFECT
LONDON (total in four years of World War I)	60	Casualties, 1,800 Damage, slight
COVENTRY (World War II total during two nights)	400	Very heavy
BIRMINGHAM (Heaviest German raid of war—total during two nights)	500	Very heavy
LONDON (Heaviest continuous raids)	250	Worst night

COMPARISONS OF BOMBINGS

Heaviest German raid (two nights)	500 tons
Proposed Joint Task Force (two nights)	6,000-10,000 tons
Heaviest German tonnage in one month (September 1940)	3,000 tons
Joint Task Force (one month)	30,000-50,000 tons
British deaths from bombing (own figures) for two years	44,000 persons
German deaths from bombing one night (Cologne)	8,000 persons (German figures) 25,000 persons (Swedish figures)

The foregoing table is of vital importance, for it indicates why no estimate of air power made before this summer is pertinent.

It refutes the contention that air power is indecisive because it has been indecisive in the past. This contention has been and is the principal obstacle to the concentrated use of Allied air power.



AIR MARSHAL SIR ARTHUR HARRIS & FRIEND*
A great calculation spurred them on.

British Combine

Destructive Power

The object of most weapons is to detonate an explosive in the face of the enemy, whether the explosive is fired from tanks, mobile artillery, siege guns, or destroyers, cruisers and battleships. Viewed in this light, bombing is the equivalent of long-range gunfire. In place of a maximum range of 25 miles, it can carry explosives 1,000 miles and plant them even at night with fair accuracy. Because the missile does not have to be fired from a gun, the casing is light and the comparisons are:

Explosive contained in largest (15") demolition shell	152 lb.
Explosive contained in torpedo	450 lb.
Explosive contained in 2,000-lb. bomb	1,100 lb.

Effect increases enormously with weight, due to increased blast. Furthermore, the bigger the bomb, the less proportionate weight goes into the casing. Thus:

250-lb. bomb, effect:	local damage
2,000-lb. bomb, effect:	destruction of everything over an area of 25,000 sq. ft. and severe blast injury to everything over 75,000 sq. ft.

The mixed effect of 500, 1,000 and 2,000-lb. bombs, as now used in mixture of explosive and incendiary, when measured by actual blast and fire areas, is such that requirement for complete destruction is estimated to be about 300 tons per square mile. Complete reduction to rubble of a manufacturing area of 20 square miles would therefore require about 6,000 tons of bombs.

During a 90-day bombing campaign the

key German cities would be smashed by 90,000 to 150,000 tons of bombs. In a six-month campaign, the bomb tonnage might reach 300,000 tons. This means that every one of the 31 key cities would receive 6-10,000 tons, or up to 20 times the total weight of bombs dropped on Birmingham. On special targets, this total can be doubled or trebled by postponing other targets or lengthening the campaign.

Cumulative effect. Since every plant destroyed places an increasingly heavy strain on the remaining plants and interrupts their flow of materials, the cumulative effect is an important factor. This in turn is stepped up by systematic destruction of key plants—power plants, blast furnaces, etc.—on which others depend.

Effect on German Morale

No account has been taken of the crack-up stage in German morale, inevitable in an air offensive of great magnitude. In any consideration of this point it must be borne in mind that:

1. Against each bombardment by night there is no defense except to the extent of small losses now inflicted.

2. Germany will find herself confronted by a breakdown in food and living supplies and the swift destruction of every source of offensive war weapons.

3. Night shifts in plants throughout Germany must work in constant apprehension of *shortly impending* death or injury, and in the knowledge that as neighboring plants are eliminated their own chances of escape become progressively smaller.

* Major General Carl ("Tooney") Spaatz, Chief of the U.S. Air Force in Great Britain.

CONCENTRATION

These facts are well known to some of the world's outstanding air authorities, and these facts have led many experts to the same conclusion: the crippling of Germany by a concentrated air attack is practicable provided the air attack is on a great scale. An outstanding summation came last spring from Air Marshal Sir Arthur Harris, present head of the R.A.F. Bomber Command:

"If I could send 20,000 bombers over Germany tonight, Germany would not be in the war tomorrow. If I could send 1,000 bombers over Germany every night, it would end the war by autumn."

Since neither the facts nor the conclusions

are secret, the immediate question arises, *why isn't it done?*

In the first place, the production of U.S. bombers, huge as it is, has only recently reached the stage where the quantity provides a *decisive* weapon.

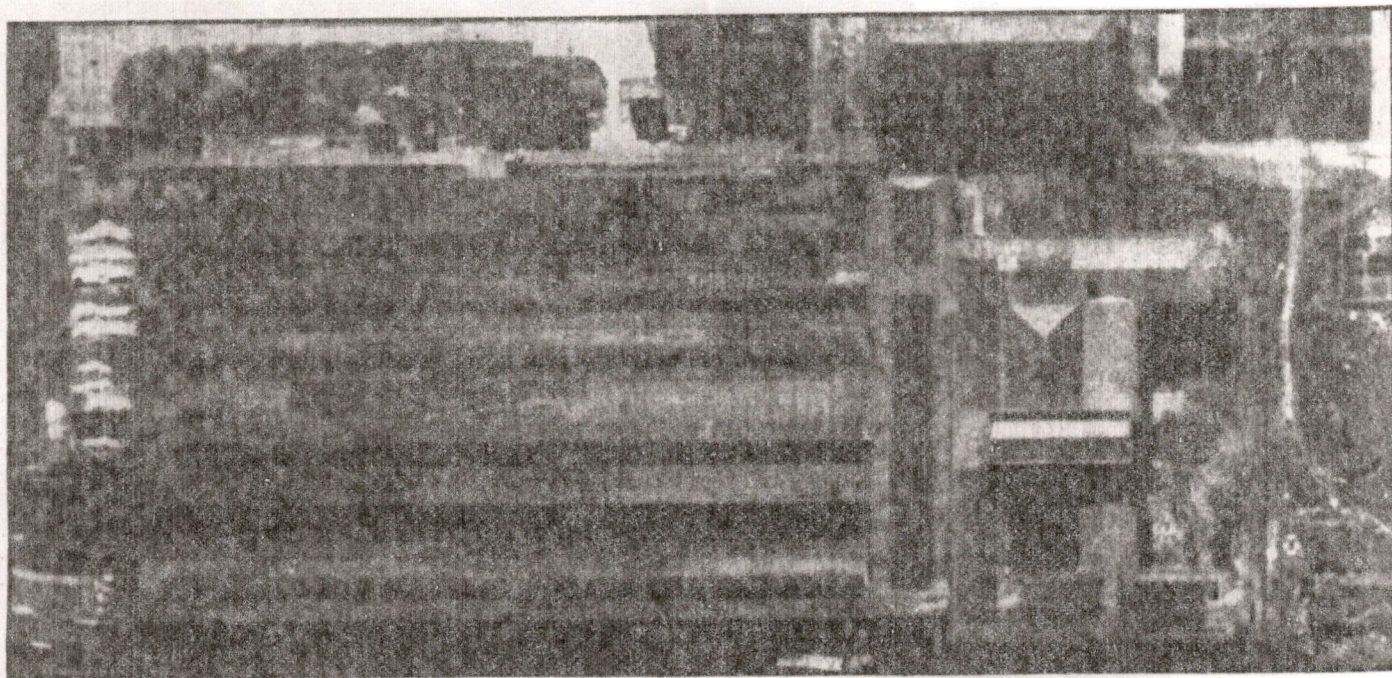
In the second place, American air power has had to be used to stop the gaps in one emergency operation after another, and has perforce been dissipated.

In the third place, public opinion has been confused by "military experts" who argue that because the bombing of Britain was indecisive, air power is *still* indecisive. This argument receives unwitting support in the shape of pleas for great fleets of super bombers which would require years to build; the misleading im-

plication being that what we now have cannot do the job.

No part of the results described in this analysis can be achieved without a policy of *concentration* of a large part of our present bombing strength and a refusal to await production still around the corner. It is of primary importance for public opinion to appreciate that U.S. air power dispersed in *all* the present theaters of action and modern war will be indecisive.

On the basis of known fact, the opportunity is here. In a little while Germany may offset the advantage in air power which today lies with Britain and the U.S. An air offensive that is too late may have missed the one chance to prevent a final German victory in World War II.



TIRE FACTORY IN COLOGNE—BEFORE AND AFTER

British Official Photographs